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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/692,960

10/24/2003

Eugen Popescu

84181-00029

1859

7590

06/29/2005

Gibson, Dunn & Crutcher LLP

Attn: Stanley J. Gradisar

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EXAMINER

NGUYEN, DAO H

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,960

Applicant(s)

POPESCU, EUGEN

Examiner

Dao H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-8 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1203.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the communications dated 10/24/2003 through 05/31/2005, claims 1-16 are active in this application.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 12/18/2003. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

3. Applicant made a provisional election without traverse to prosecute the invention of Group I, claims 1-8, drawn to method for making semiconductor devices. Affirmation of this election was made in the Response to Restriction Requirement filed 05/31/2005.

Claims 9-16 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim(s) 7 is/are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "said at least on lead frame". There is insufficient antecedent basis for this limitation in the claim. Such limitation is not found in the base claim 1.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim(s) 1 is rejected under 35 U. S. C. § 102 (b) as being anticipated by US Patent No. 4,703,567 to Moore et al., and US Patent No. 5,011,062 to Nakanishi et al.

Regarding claim 1, Moore discloses a method for making a semiconductor device/assembly, wherein the method comprising the step of welding ultrasonically a copper foil to an aluminum heat sink, then soldering the formed structure to a heat generating electrical component such as a semiconductor device which may be a Rectifier or the like (col. 1, lines 49-52). See also col. 1, lines 5-65; col. 2, lines 26-54.

Similarly, Nakanishi discloses an ultrasonic welding method for welding an aluminum backplate or heat sink 12 (fig. 1) to a copper buffer or copper foil 10. Nakanishi is silent about soldering the formed structure to a semiconductor device which includes a substrate and a semiconductor element attached to the substrate. However, this is inherent since the structure of Nakanishi is definitely for used with a semiconductor element. See col. 1, lines 4-26; col. 2, lines 14-59.

8. Claim(s) 1, 3 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,272,375 to Belopolsky.

Regarding claim 1, Belopolsky discloses a method for making a solid state relay, as shown in figs. 1-4, the method comprising the steps of:

- (a) welding ultrasonically a copper foil 5 to a heat sink 6 (col. 4, lines 52-60.;
- (b) soldering a substrate 4 to said copper foil 5; and

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(c) soldering an output switching element 1 to said substrate 4; wherein said copper foil 5 increases solder coverage between said heat sink 6 and said substrate 4, improving a heat transfer from said output switching element 1 to said heat sink 6. See also col. 1, lines 12-34; col. 2, line 25 to col. 6, line 34.

Regarding claim 3, Beloposky discloses a method wherein step (a) further comprises the step of: welding ultrasonically said copper foil to a non-nickel-plated aluminum heat sink. See col. 4, lines 50-60.

Claim Rejections - 35 U.S.C. § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim(s) 2, 4-6 and 8 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,272,375 to Beloposky, in view of the following remarks.

Regarding claim 2, Beloposky discloses the method comprising all claimed limitations, except for further soldering at least one lead frame to the substrate; and (d) soldering the output switching element to said at least one lead frame. However, it would have been obvious to one having ordinary skill in the art at the time the invention

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was made to modify the invention of Beloposlky to further include such step(s) because it is well known in the art that a semiconductor element can be supported by a lead frame to increase strengthen and also to provide additional connections to the external.

Regarding claims 4-6 and 8, Beloposlky discloses the method(s) obviously comprising all claimed limitations. Note that it would have been an obvious to one of ordinary skill in the art that the time to ultrasonically weld a portion and the power used, as well as the number of passes and the thickness and/or the composition of the copper foil depend on the desired uniformity and/or adhesion between the copper foil and the heat sink, and on the desired application of the device , and that such limitation(s) can be performed with only routine skills in the art. See also col.5, line 28 to col. 8, line 43.

Conclusion

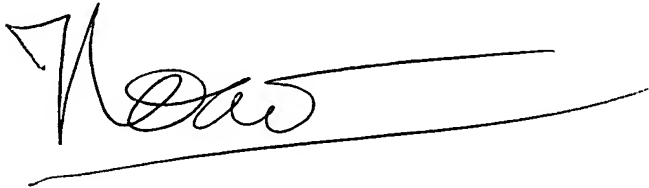
11. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in dark ink, appearing to read 'Dao H. Nguyen', with a long horizontal line extending to the right.

Dao H. Nguyen
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June 27, 2005

A handwritten signature in dark ink, appearing to read 'David Nelms', with a large loop at the top.

David Nelms
Supervisory Patent Examiner
Technology Center 2800